

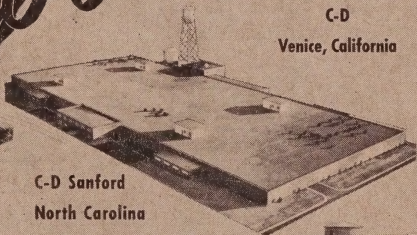
the CORNELL-DUBILIER Capacitor



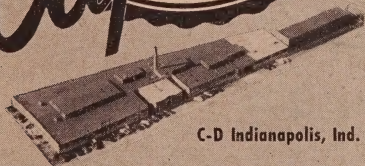
Subsidiary
The Radiart Corp.
Cleveland, Ohio



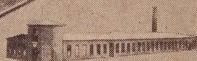
C-D
Venice, California



C-D Sanford
North Carolina



C-D Indianapolis, Ind.



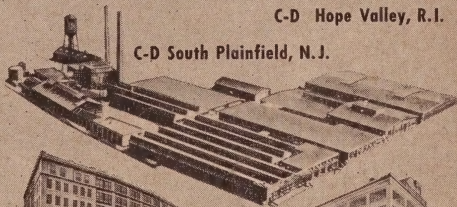
C-D Hope Valley, R.I.



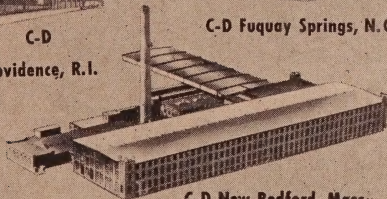
C-D
Providence, R.I.



C-D Fuquay Springs, N.C.



C-D South Plainfield, N.J.



C-D New Bedford, Mass.



C-D Worcester, Mass.



C-D Cambridge, Mass.

Vol. 21

SEPTEMBER, 1956

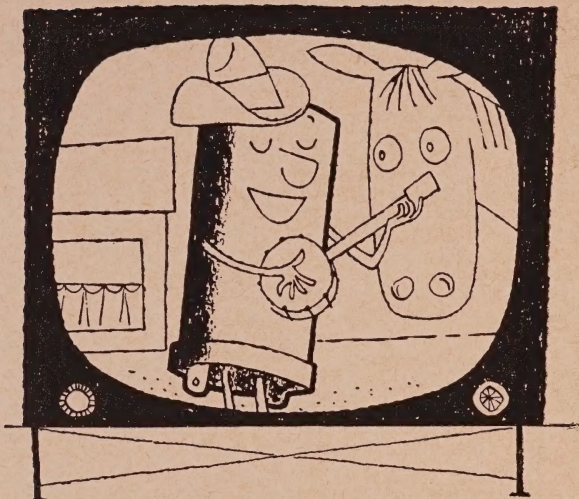
No. 9

CORNELL-DUBILIER ELECTRIC CORP.
Hamilton Boulevard, South Plainfield, N. J.

POSTMASTER: If undeliverable for any reason,
notify stating reason, on Form 3547 postage for
which is guaranteed.

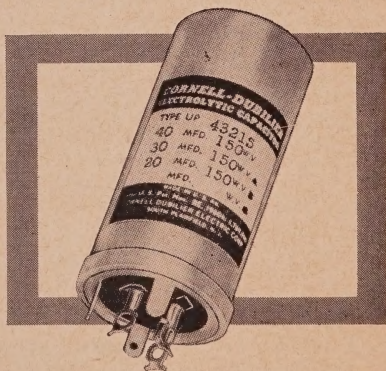
Sec. 34.66 P.L.&R.
U. S. POSTAGE
PAID
So. Plainfield, N. J.
Permit No. 1

CANONSBURG, PA.



TV's most popular twist-prong electrolytic...C-D's type "UP"

Specified by the industry's leading TV set manufacturers—adopted by “service-wise” technicians, the C-D “UP” is first-choice for wide range twist-prong replacement service—rugged, dependable service-life under conditions of high temperature and high voltage surges. (With a special “UPE” unit for selenium rectifier circuits.) Stock and service problems are “down” with “UP”. Ask your nearby C-D Distributor for catalog, or write Cornell-Dubilier Electric Corporation, South Plainfield, N. J.



Cornell-Dubilier capacitors

South Plainfield, N. J. ; New Bedford, Worcester & Cambridge, Mass.; Providence & Hope Valley, R. I.; Indianapolis, Ind., Sanford, Fuquay Springs & Varina, N. C.; Venice, Calif., & subsidiary, The Radiart Corporation, Cleveland, Ohio.

SIMPLE D-C VOLTAGE STANDARDIZERS

The accurate measurement of d-c voltage is the basis of a wide variety of electrical tests. Even when d-c voltage itself is not the parameter of interest, this voltage measurement often is at the bottom of the actual test operation. Among examples are measurements of a-c, d-c, and r-f current, a-c voltage, frequency, frequency deviation, temperature, strain, piezoelectricity, thermoelectricity, light intensity, and resistance.

In all applications involving d-c voltage measurement, standardization is a requisite. This is accomplished by (1) maintenance of an accurate voltage standard to which unknown voltages may be compared, or (2) means for the generation of accurate voltages for the direct calibration of instruments or for purposes of comparison.

In the laboratory, potentiometric measurements are employed for voltage comparison. In this instance, a potentiometer is used to compare an unknown d-c voltage to the emf of a standard cell (of the order of 1.0183 volt). Precision potentiometers currently in use indicate international (U. S.) volts or absolute volts. International volts = 0.99966 absolute volts, and absolute volts = 1.00034 international volts. Potentials higher than that of the standard cell are reduced, before application to the potentiometer, by means of a precision voltage divider, termed a **volt-box**.

When precise voltage generation, instead of voltage comparison, is desired in the laboratory, standard voltages are obtained from a stable d-c source, through a precision voltage divider, and are referred to the potentiometer for an accurate determination of their magnitudes.

Experimenters and small laboratories or shops operated within limited budgets seldom employ potentiometric

methods because the latter are based on the use of expensive, delicate standard cells. It is interesting to note, however, that the mercury battery has sufficient voltage stability to permit its use as an inexpensive standard cell and thus will afford the experimenter a simple standard to which unknown voltages may be referred. It is practicable also to employ this cell, or combinations of cells, as the source of known potentials in d-c signal generators.

The mercury battery has an emf of 1.345 volt which is maintained with good constancy throughout its operating life. A convenient reference level of 1 volt may be obtained from the cell easily through a suitable voltage divider.

Reference Principle

The principle involved in voltage comparison is simple. When the standard voltage and unknown voltage are applied in series-opposition with each other to a current meter, usually a center-zero d-c galvanometer, there will be no deflection of the meter if the voltages are exactly equal, since they buck each other out. With suitable connections to the meter, a positive deflection will be obtained when the unknown exceeds the standard, and a negative deflection when the unknown is less than the standard.

When the unknown is much larger than the standard voltage, a calibrated potentiometer is employed to reduce the unknown to the standard value. This accounts for the name of the method. When the potentiometer is adjusted for galvanometer null, the output voltage of the potentiometer equals the standard voltage, and the unknown value may be determined from the standard voltage and the potentiometer settings:

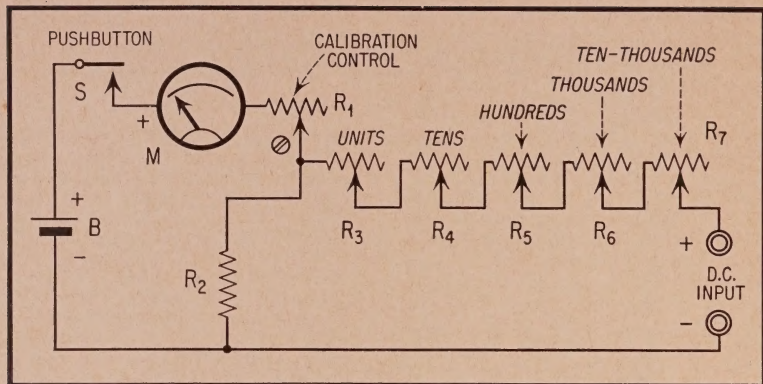


Fig. 1. Decade-Type Standardizer.

$$(1) \quad e = E(R/r)$$

Where e = unknown voltage (volts)

E = standard voltage (volts)

R = total resistance of potentiometer (ohms)

r = output resistance setting of potentiometer at null (ohms)

Potentiometric Standardizers

Figures 1 and 2 show the circuits of potentiometric-type voltage standardizers employing mercury batteries as standard cells. These are practical circuits which may be built readily by the experimenter as complete, self-contained instruments, or assembled as temporary bench-top setups.

Decade-Type. In the circuit given in Figure 1, the variable resistor is a conventional decade box system (R_3 – R_4 – R_5 – R_6 – R_7). Section R_3 consists of ten 1-ohm resistors, R_4 ten 10-ohm, R_5 ten 100-ohm, R_6 ten 1000 ohm, and R_7 ten 10,000-ohm units. The use of a full complement of units, tens, hundreds, thousands, and ten-thousands decades gives an accurate variable-resistor range of 1 ohm to 111,110 ohms in 1-ohm steps. Galvanometer M is a 1-0-1 center-zero d-c milliammeter.

Adjustment of the calibration-con-

trol rheostat, R_1 , allows the voltage across the 1000-ohm precision resistor (R_2) to be set exactly to 1 volt. Unknown voltages applied to the D-C INPUT terminals then are compared to this 1-volt potential by adjusting the decades (R_3 to R_7) for galvanometer null. At null, the unknown voltage (e) is:

$$(2) \quad e = \frac{E(R_2 + R_3 + R_4 + R_5 + R_6 + R_7)}{R_2}$$

But since $E = 1$:

$$(3) \quad e = \frac{R_2 + R_3 + R_4 + R_5 + R_6 + R_7}{R_2}$$

The pushbutton switch, S, is provided for protection of the meter and for reduction of the time that battery B is required to supply current to the circuit. The button is tapped while the decade sections are adjusted until null is attained.

Rheostat R_1 should be mounted inside the instrument case where its setting will be protected from accidental disturbance. Its shaft is provided with a slot for screwdriver adjustment, since R_1 does not require frequent readjustment. This control is set initially to give exactly 1 volt

drop across R_2 (with the D-C INPUT terminals open). This voltage may be checked by means of an accurate, high-resistance d-c voltmeter connected temporarily across R_2 , or simply by setting R_1 for a full 1-milliamperes deflection of meter M.

This circuit provides voltage measurements between 1 and 100 volts. A lower potential (e_1) may be measured by applying it to the D-C INPUT terminals in series-aiding with a known low voltage (e_2), such as $1\frac{1}{2}$ volt, previously measured. The total voltage (e_3) then is measured and the unknown small voltage determined from the subtraction, $e_1 = e_3 - e_2$.

Helical-Potentiometer-Type. The decade boxes will not be preferred in all applications nor by all users. Whatever variable resistor is used, however, must be capable of close settings within its 0-to-100,000-ohm range, and must admit of close calibration and direct readings.

Common, single-turn rheostats and potentiometers are incapable of this accuracy. Ten-turn helical potentiometers (such as **Helipot** and **Micropot**) are suitable, however, and the 10-turn

dials employed with these units may be read directly by adding the proper number of ciphers mentally to their settings.

Except for the substitution of the helical potentiometer, the circuit in Figure 2 is seen to be identical to the one given in Figure 1. The operating principle is the same, and the operating instructions, including Equations (2) and (3), apply.

While the helical potentiometer does not afford the extreme closeness (1-ohm) of setting obtained with decade boxes, its accuracy is sufficient for a number of practical applications and its extreme compactness, compared with the decade box, will recommend it in many instances.

Other Types. Limitation of this discussion to the two types of circuit, given in Figures 1 and 2, is not meant to imply that these are the only examples of simple, potentiometric circuits for voltage comparison. Other schemes are available but, for the most part, are variations of the arrangements shown here. Furthermore, the two circuits given here use available components.

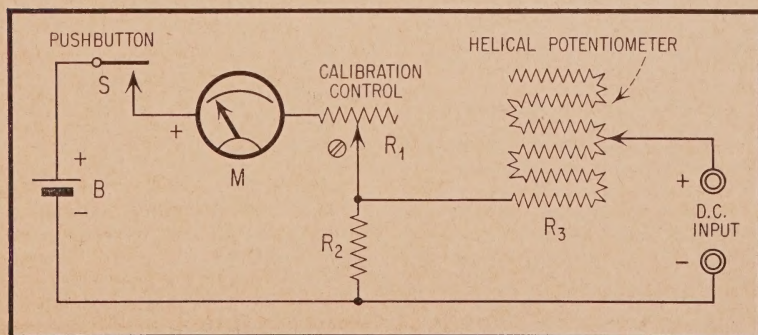


Fig. 2. Helical-Potentiometer-Type Standardizer.

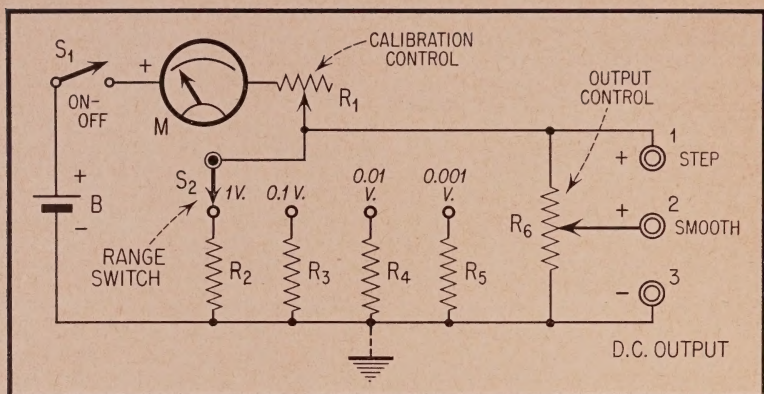


Fig. 3. D-C Signal Generator.

It is possible, for example, to construct a conventional, laboratory-type potentiometer and to employ the mercury battery in it in place of the usual standard cell. The procedure usually is to build a slide wire by stretching a length of resistance wire tautly along a meter stick or yard stick. This serves as a potentiometer when provided with a sliding clip-contact, and the R and r values are read as length units along the stick. This construction procedure is recommended in some quarters. However, suitable resistance wire is not obtained readily by the experimenter and we prefer the use of calibrated resistors instead.

D-C Signal Generators

Aside from voltage comparison, another requirement is that accurate d-c voltages be obtainable for testing. These known potentials may be used for the calibration, standardization, or spot-checking of such instruments and devices as voltmeters, d-c oscilloscopes, oscillographs and other recorders, sensitive relays, potentiometers, strain gauge circuitry, etc.

Such voltages are obtainable from a standard voltage source through accurate voltage dividers. The setup conveniently has been called a d-c signal generator. Figures 3, 4, and 5 illustrate several versions of the generator.

Single-Battery Type. In Figure 3, a single mercury battery, B , is employed. The basic voltage of this battery is divided by a voltage divider consisting of R_1 and whichever resistor is selected by switch S_2 .

The calibration control rheostat, R_1 , is set for exactly 1 milliampere of current (as indicated by meter M) through the selected resistor. Thus, 1 ma flowing through R_2 (1000 ohms) produces an output-voltage drop of 1 volt across this resistor. Similarly, 1 ma in R_3 (100 ohms) produces 0.1 v or 100 millivolts, in R_4 (10 ohms) 0.01 v or 10 mv, and in R_5 (1 ohm) 0.001 v or 1 mv.

These step-voltage values appear at the D-C OUTPUT terminals 1 and 3 as switch S_2 is set to the desired level,

and control R_1 set for 1 ma standard current. If a smooth control of voltage, from zero to maximum, is desired in any voltage step, output connection must be made to D-C OUTPUT terminals 2 and 3. The 10,000-ohm OUTPUT CONTROL potentiometer, R_6 , permits setting of the level closely. With S_2 in the position shown in Figure 3, for example, the output voltage is adjustable between zero and 1 volt.

Step-Type. Figure 4 shows a circuit employing seven, series-connected mercury batteries to provide standard output voltages equal to multiples of the battery voltage. Thus, seven voltages are supplied between 1.34 and 9.41 volts.

While the two decimal places, in each instance, give these potentials odd values, the voltages are useful nonetheless in many applications in which the absence of resistor (voltage-divider) networks and the voltage stability of

the mercury battery are desirable features.

Line - Operated - Type. The standard-voltage generator shown in Figure 5 utilizes the constant voltage drop across a gaseous regulator tube as the source of steady d-c voltage, and is designed for operation from the a-c power line.

Here, the 105-volt drop across an OC3/VR105 tube is employed and this potential is reduced to the convenient level of 100 v, at the top of resistor R_4 , by means of rheostat R_3 . The voltage divider comprised by resistors R_4 to R_{14} supplies standard voltages of 1, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 volts.

The simple half-wave power supply employs an isolation transformer (T), selenium rectifier (SE), tube current-limiting resistor (R_2), and filter capacitor (C). The limiting resistor (R_2) also serves as a filter resistor. The rectifier current-limiting resistor (R_1) is essential to prevent surge damage

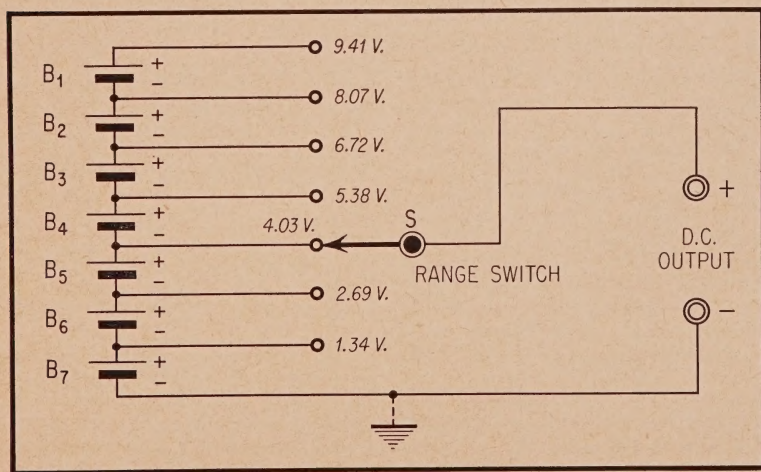


Fig. 4. Step-Type Voltage Standard.

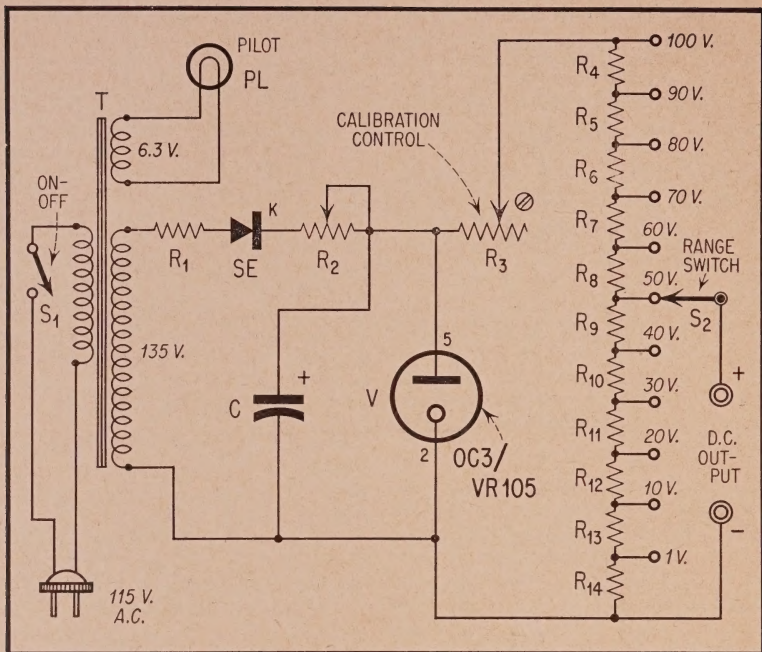


Fig. 5. AC-Line-Operated Voltage Standard.

to the rectifier. The isolation transformer is necessary for the prevention of electric shock and to reduce interaction between the signal generator and other instruments connected to it.

The precision of the resistors in the voltage-divider string (R_4 to R_{14}) determines the accuracy of the voltages delivered at the D-C OUTPUT terminals. For best results, these components should be 1% wirewound units.

The following procedure must be followed in the initial adjustment of the instrument: (1) Temporarily disconnect R_3 from the power supply. (2) Connect a 0-50 d-c milliammeter temporarily in series with terminal 5 of the OC3 tube. (3) Switch-on the

power and adjust the slider on R_3 for a meter deflection of 40 ma. (4) Switch-off the power, remove the milliammeter, and restore the circuit. (5) Connect a high-resistance d-c voltmeter between the D-C OUTPUT terminals. (6) Set switch S_2 to its 100-volt position. (7) Switch-on the power and set R_3 for a voltmeter reading of 100 volts. The adjustment now is completed.

The shaft of potentiometer R_3 is slotted for screwdriver adjustment and this control is mounted inside the instrument case to protect its adjustment from accidental disturbance. This control setting needs correction only occasionally.

PARTS LIST FOR FIGURE 1

B—Mercury "A" Battery — Mallory RM3R
 M—1 - 0 - 1 center-zero D-C Milliammeter
 R₁—2500-ohm wirewound potentiometer
 R₂—1000 ohms 1-watt 1%
 R₃—Units Resistor Decade
 R₄—Tens Resistor Decade
 R₅—Hundreds Resistor Decade
 R₆—Thousands Resistor Decade
 R₇—Ten-Thousands Resistor Decade
 S—Pushbutton Switch (normally-open)

PARTS LIST FOR FIGURE 2

B—Mercury "A" Battery — Mallory RM3R
 M—1 - 0 - 1 center-zero D-C Milliammeter
 R₁—2500-ohm wirewound potentiometer
 R₂—1000 ohms 1-watt 1%
 R₃—100,000 ohm Helical-Type Potentiometer—Borg Type 205 Micropot
 S—Pushbutton Switch (normally-open)

PARTS LIST FOR FIGURE 3

B—Mercury "A" Battery — Mallory RM3R
 M—0-1 D-C Milliammeter
 R₁—2000-ohm wirewound potentiometer
 R₂—1000-ohm 1-watt 1%
 R₃—100-ohm 1-watt 1%

R₄—10-ohm 1-watt 1%
 R₅—1-ohm 1-watt 1%
 R₆—10,000-ohm wirewound potentiometer
 S₁—Spst toggle switch
 S₂—Single-gang, single-pole, 4-position, non-shorting, rotary selector switch — Centralab PA-1000

PARTS LIST FOR FIGURE 4

B₁ to B₇—Mercury "A" Batteries — Mallory RM1R
 S—Single-gang, single-pole, 7-position, non-shorting, rotary selector switch — Centralab PA-1000

PARTS LIST FOR FIGURE 5

C—10 ufd 450 dcwv electrolytic — Cornell-Dubilier BR-1045
 PL—6.3-volt pilot lamp
 R₁—5-ohm 2-watt carbon
 R₂—2000 ohms 10-watt wirewound, with slider
 R₃—2000-ohm wirewound potentiometer
 R₄ to R₁₂—1000-ohm 1-watt (See Text)
 R₁₃—900-ohm 1-watt (See Text)
 R₁₄—100-ohm 1-watt (See Text)
 S₁—Spst toggle switch
 S₂—Single-gang, single-pole, 11-position, non-shorting, rotary selector switch — Centralab PA-1000
 SE—75-ma selenium rectifier
 T—Miniature Power Transformer: 135 v, 50 ma; 6.3 v, 1.5 A — Triad R-30X
 V—OC3/VR105 voltage regulator tube



This CORNELL-DUBILIER Advertising Service is FREE to "Capacitor" readers. If there is anything of general interest or appeal in the line of **electronic** equipment or service that you want to BUY — SELL — or SWAP . . . if you want a job or need help, these columns are at your service.

Please PRINT or TYPE your Ad clearly and limit it to 40 words including your name and address. Because of space limitations — only one Ad at a time — please.

Ads are published in the order received and as space permits.

WANTED — RF section complete with gang switch for Hallicrafter model S-40A, or junk S-40A with good RF section and gang switch. J. L. Huffman, 324 Miller St., Blacksburg, Va.

WANTED — Radio-TV repairman, prefer experienced man or student with some experience in Radio-TV, car radios, and ant. installations. State qualifications and salary expected. Tomalino Radio & TV, Glendive, Mont.

STOLEN — 12" Sylvania model 125 TV receiver Serial 3988 (or 3918) — 120.1727. Reward for recovery. Edw. Buckman, 16 Oxford St., Wilkes-Barre, Pa.

FOR SALE — Used books on electronic engineering, communications, radio and TV servicing. Write for list. C. Adler, 556 West 191st St., New York 40, N. Y.

WANTED — Tuner for Tele-Tone TV model TV318, or junk set with tuner intact. Tomar Services, Box 36, New Ellenton, S. C.

FOR SALE — Kay megasweep, \$100; RCA Senior Voltomyst, \$40; E-400 Precision sweep gen., \$85; Hickok 505 5" scope, \$40; RCP VTVM, \$35. Fred E. Saron, 844 E. 18th St., Brooklyn, N. Y.

CORNELL-DUBILIER ELECTRIC CORP. reserves the right to edit your Ad to conform to its policies and is the final judge of its suitability for publication. We do not assume any liability or responsibility for any transaction that results. Make your deal direct with the advertiser listed in the Ad.

If you have a "CHANGE OF ADDRESS" — give both your OLD and NEW and mark your request "For C-D Capacitor Mailing List."

IF YOU ARE RECEIVING DUPLICATE COPIES FOR WHICH YOU HAVE NO USE, PLEASE ADVISE YOUR LETTER CARRIER STATING — "DUPLICATE — NOT WANTED".

FOR SALE — Precision tube tester and VOM 654, \$60; Hickok 19XD sig. gen., \$60; Transvision CRT tester and reactor, \$10. All FOB. Service, Radio and TV Service Dealer, Technician, Popular Science, others. T. Wojciechowski, 2837 Fulton St., Brooklyn 7, N. Y.

FOR SALE — Sam's Photofacts, 31 to 150 in binders, l. n., \$60; Oak Ridge picture tube tester, \$15. You pay shipping. W. R. Banedt, Box 254, R. 4, Antioch, Ill.

FOR SALE — Like new Vibroplex deluxe "original" jeweled bug with carrying case; Heathkit AC-1 antenna coupler; Vim Sheftel colorimeter with case and manual. John J. Oskay, 70 Senior St., New Brunswick, N. J.

FOR SALE — Antique radio receivers, all makes, 1920 thru 1927; several old tubes, old recordings and radio-phono combos. Howard C. Bergstrom, 1717 South 29th St., Omaha 5, Nebr.

FOR SALE — Complete Rec-O-Kut disc recording outfit worth over \$1,000, incl. portable radio-recorder, \$250 or part cash and trade electronic equip. Interested in all McMurdo-Silver equip. R. W. Hart, 1545 Ormond, Corpus Christi, Tex.

WANTED — FM receiver 21-99 mc. band, in good condition, reasonably priced. Radio Center, 20 Thorpe Ave., St. Albans, Vt.

FOR SALE — RCA 2C40, \$7; 7C4, 7F7 tubes. J. D. McNeal, 794 Quinpiac Ave., New Haven 13, Conn.

TRADE — 16 mm silent projector, stamp vending machine, for old discarded radios. R. E. Bridges, 217 Lineberger St., Shelby, N. C.

SELL OR TRADE — Heath RF sig. gen. No. 8 and Transvision four-in-one, tests flybacks, yokes, CRT and sel. rectifiers, A-1 cond. H. A. Johnson, 8218-10 Ave., Brooklyn 28, N. Y.

WANTED — Manual or schematic of Alrecon model 1222A preamp. Have to sell, model 12 Tele-typewriter, exc. cond., \$85; Panadapter SP-44, \$50; Leece-Neville 80 amp. system complete with brackets and harness, \$45. A. G. Stavros, 116-32 132 St., So. Ozone Park 20, N. Y.

FOR SALE — Collins plate xformer, potted, CCS ratings of 1100 v.c.t. at 212 amps., \$12. Want National 50J audio filter, Dow Key coax relay for 110 v. AC. Will pay cash. Al Miller, 1889 Webster Ave., Bronx, N. Y.

FOR SALE — Lysco 600S with inst. book, exc. cond., hardly used, \$130. J. C. Squillaro, RD 3, Box 304, Bangor, Pa.

SELL OR TRADE — 12 v. ATR inverters, output 100 w. 60 cy. with radio filter, used but in good cond. Want 6-110 volt 60 cy. ATR or CD inverter. Donald Slattery, Rt. 2, Loveland, Colo.

FOR SALE — Florida TV business, \$20,000 gross in 1955, completely equipped shop, modern test equip., fresh stock. Retiring. Van's Radio and TV, 5320 Nebraska Ave., Tampa, Fla.

TRADE — Simpson model 355 VOM in perf. condition for good 10" slide rule. R. C. Ragan, 2700 Park St., Arlington Heights, Ill.

BEST OFFER — BC-348-J receiver, AC power supply in one unit added audio stage for spkr operation, crystal filter. D. Serice, 2946 Upon Street, N.W., Washington 8, D. C.

WANTED — 12" coax Hi-Fi speaker with or without cabinet. State manufacturer, model number, condition, and lowest delivered price. D. Kurs, 321 Fairmount Ave., Jersey City 6, N. J.

FOR SALE — Palco model 606, 6 v. power supply, used 30 hours, complete with control relay and spare fuses, \$25 FOB. H. H. Wesebaum, 270 North Olive St., Elyria, Ohio.

FOR SALE — Bendix TA-12D xmitter, ideal for novice, \$25; T-14/TRC-1 telephone carrier xmitter, \$65; 813's, \$6.75; 810's, \$7.50; AN/PRS-1 mine detector, \$30. Bill Slep, Box 178, Ellenton, Fla.

SWAP OR SELL — Collaro changer RC 3/351 with GE triple play diamond stylus; Heath TC-2 tube checker with new roll chart, 1 n., professional wiring; E. H. Scott 33-tube Philharmonic AM-FM (50 mc. band). Want Precise 300-K scope. L. Karger, 92 Hatfield St., Caldwell, N. J.

FOR SALE — B & W 20 hdl. 1 kw. tank coil, \$4.75; 3 mfd., 4000 v. DC filter condenser from BC-610 with mounting bracket, \$5; Ward-Leonard K.W. plus antenna changeover relay, Cat. No. 507-521A, 115 v AC coil, \$9.50. S. C. Macy, 2346 Dundee Rd., Louisville 5, Ky.

FOR SALE — Kw final, push-pull 8000 B & W butterfly condenser, 72" Par-Metal cabinet (like new), 1500 v. power supply, meters, etc. C. Garrigus, RD 3, Meadville, Pa.

FOR SALE — Gazette magazines (official publication of U. S. Patent Office) issues Jan. '53 thru June '55, including complete diagrams and descriptions of all patents and trademarks issued during that period, \$25 FOB. William Hintz, Box 243, Hopkins, Minn.

FOR SALE — Mallory TV88 UHF converter, like new in orig. carton, \$16.50; RCA U-70 UHF converter, \$15. Grayson Radio Electronics, 1211 West Franklin Ave., Gastonia, N. C.

SWAP — Precision sweep gen. E-400; Stancor P8044 plate transformer; C-D vibrator converter, mod. 2976, for Revere stereo or single lens reflex cameras, projectors or binoculars. Paul Jorick, Jr., 29 Nichols Ave., Stamford, Conn.

FOR SALE — One each 600 and 300 w. modulation xmfr.; 2500-2500 power supplies; Hi-voltage swinging and smoothing chokes; 2500 v. DC meters. D. Howerdel, 223 Terrace Ave., Jersey City, N. J.

WANTED — Diagrams or tech. manuals for R-74/CRW-2 or CW-46196 receivers, ZB-3, RAX-1, BC-499, MN-26-K, MN-26-L, RA-10DB. Want also MT-68 rack, DA-12, DA-14 dynamotors. W. H. Bauer, 119 North Birchwood Ave., Louisville 6, Ky.

FOR SALE — Eico model 566 Volt-ohm-milliamperemeter, perf., best offer over \$10. J. W. Kuhnemund, Yarmouth Rd., Harrison, White Plains PO, N. Y.

SWAP — Superior sig. tracer model CA-12 and RCP 447B multimeter, for Heathkit VTVM model V-7A. Kenneth L. Green, Box 323, Republic, Mo.

FOR SALE — Hallicrafters 6 v. DC power supply for HT-11 Marine radiophone. Edwin J. Koeller, 5435 So. Mozart St., Chicago 32, Ill.

SELL OR SWAP — Like new Heathkit AT-1 xmtr with crystal ready to go, \$30, or swap toward 6 and/or 2-meter receiver. P. D. Boothroyd, Box 142-G, Sparta, N. J.

FOR SALE — RCA type WR-40A UHF sweep and marker gen., uses pencil triodes in both sweep and marker oscillators, includes built-in 1 and 10 mc. crystal marker gen., \$300. Budelman Radio, 375 Fairfield Ave., Stamford, Conn.

SELL OR TRADE — 53 copies Radio News, 1947-53, 10 cents each FOB. Charles Remick, 7 Elizabeth Pkwy., Eatontown, N. J.

WANTED — 6-volt battery eliminator for use on car radio work. State price and condition. Floyd Windsor, Rt. 11, Box 325-H, Birmingham, Ala.

URGENTLY NEED — Navy selsyns or synchros, sizes 1, 3 and 23. Advise price, condition and manufacturer. Also need transmitting tubes. Electro Sales Co., Inc., 50-58 Eastern Ave., Boston 13, Mass.

SELL — Millen 90810 (2-6-10 meters) xmtr, with all tubes and coils, \$65, and 90281 power supply, \$38; 40 w. modulator with power supply, \$25. Want coax rela and 110 v., 60 cy., single phase gen. (50-1000 w.). Roy Sawdey, 5255 Harper Rd., Solon, Ohio.

SELL OR SWAP — Airline 30 w. mobile 6-110 v. sound system, with microphone and extension cords, University trumpets, driver units; 3-speed phonograph; Heathkit 0-7 scope with RF probe. Write for all details. John Zaghis, 2402-11th St., Santa Monica, Calif.

FOR SALE — 1/2 hp. 4000 rpm DC servo motor with matching amplidyne MG drive for heavy antenna with control power 1 watt, \$25; dual output MG 875 v., 350 ma., 300 v., 200 ma., input 120 v., 8.3 a. DC, \$25. T. S. Winters, Box 9, Englewood, N. J.

SELL OR TRADE — H.V. power supplies, tubes and parts, for SSB equip., exciter or xmtr. Bill Grebe, 518 W. 9th, Loveland, Colo.

WANTED — Electrical rotator unit for beam antenna unit; also direction indicator meter and control box. R. Cassandra, 29-23 Curtis St., East Elmhurst 69, L. I., N. Y.

WANT — ART 13 xmtr, new or used, or parts. Have 813 xmtr in enclosed relay rack for sale or trade with 2000 v. power supply, will run approx. 400 w. on 20 m. J. E. Mosteller, Andrews, N. C.

FOR SALE — Used Motorola comm. FM mobile unit, easily converted to 2-meter; FTR mobile units, same band; mobile xtal-controlled rcvrs; vibrapacks, etc. Cheap. C. N. Vallette, 4850 Lancaster Ave., Philadelphia, Pa.

SELL OR TRADE — Eico dynamotor 6 v. IP, 475 v. @ 175 ma. OP; 1950 NRI communication course and National Schools radio-TV serv. course, no kits. Any item, \$15, or what have you? J. F. Larkin, 803 West Washington St., East Point, Ga.

FOR SALE — Cartrol and Motorola control heads to fit cars 1941 to 1954. To be used with Motorola radios. McKay Radio, 4015 MacArthur Blvd., Oakland, Calif.

FOR SALE — 500 ma. and 50 ma. DC 4" G.E. rect. meters, used but in good cond., \$3 each plus shipping. William Kalish, 687 Center Rd., East Meadow, L. I., N. Y.

WANTED — Sun Electric Corp. tester model AE for testing Guide Autronic Eye automatic headlight control, must be reasonable. Send complete info. Fox Radio & TV Service, 3136A 10th St., N., Arlington 1, Va.

WANTED — APR-4 rcvr and tuning units TN-16, 17, 18, 19, & 54; BC-788C, ARN-6, BC-610, BC-221, 342, 312. Cash or trade for new equip. Tom Howard, Alltronics, Box 19, Boston 1, Mass.

WANTED — All kinds radio, TV, electronic and scientific equip., and electronic publications to buy or swap. What do you need? John Richard, 4 Donegal Pl., Marietta, Pa.

WANTED — Crosley Pup receiver; old tubes type WD 11, 12, UV and UX 199, in new or working cond. George Haymans, Box 468, Gainesville, Ga.

WANTED — AM sig. gen., 75 kc - 110 mc.; TV FM sweep generator; VTVM; oscilloscope and tube tester. Travis Heard, 10260 Oakland, Detroit 11, Mich.

WANTED — Radio and TV service equip.; 35 mm camera and enlarger. State condition and lowest cash price. Frank Sabin, 4226 Decatur St., Philadelphia 36, Pa.

FOR SALE — Sound projector 750 w. Eastman FB-25 Kodascope, in case, ten tubes, silent and sound speed, excellent cond. Bob Eubank, 1227 Windsor Ave., Richmond 27, Va.

FOR SALE — Magnacordette BT6-BGAH binaural tape recorder, with twin preamps in blond cabinet, perf. cond., \$500 or make offer. Jim Babcock, 2441 Webb Ave., Bronx 68, N. Y.

SELL OR TRADE — Collins 32B Phone CW pre-war xmitter, \$100; BC-348Q receiver, \$75; Remington typewriter, \$25; unused Underwood portable, \$55; Hallicrafters novice complete transmitter, \$50. K. H. Stello, 4504 Hartwick Rd., College Park, Md.

FOR SALE — Mark II 40 and 80 meter receiver and transmitter, converted with power, \$25, local preferred. Herbert Greenberg, 821 Rutgers Rd., Franklin Sq., N. Y.

FOR SALE — Used Concertone (tape-recorder) playback heads, 200 to 15 kc, single track, Hi-output, beautiful cond., \$3 each. Harold Dropkin, 4077 West Blvd., Los Angeles 8, Calif.

FOR SALE — Eico 425 scope, \$20; Superior super-meter 670-A, \$20, both guaranteed perfect. E. Nilsen, 136 Prospect Place, Brooklyn 17, N. Y.

FOR SALE — 12" Silvertone TV set with antenna and new picture tube, 1 year guarantee, \$45. Kenneth Schwieker, 4163 1st Ave. No., St. Petersburg, Fla.

FOR SALE — SX-71 in sealed carton, with matching speaker, \$195 FOB; 40-50 mc FM tuner; 200-400 kc aircraft radio, 78 rpm phon-osc., mimeo, communicator II. R. Lackner, 2029 Bradley, Chicago 18, Ill.

FOR SALE — Heathkit condenser checker C-2, signal tracer T-2, signal generator SG-7, \$19.50 each; Eico flyback and yoke tester 944, \$24; Eico 1050 battery eliminator 6 and 12 v., \$30. All like new with leads and instructions. E. A. Hudson, 113 Golf Ave., Mt. Rt. 7, Ellwood City, Pa.

SELL OR SWAP — SX42 NC 57, NC 88, two RCA 630 10" TV sets, Pilot T-601 FM tuners. What have you? John Broniszewski, 1945 N. Damen Ave., Chicago 47, Ill.

FOR SALE — NC-173, \$125; Sonar VFX-680 NBFM, VFO exciter in case, \$15. M. Nesselroth, 255 Columbia Ave., Irvington, N. J.

FOR SALE — Hickok 610A sweep gen., practically new, with 4.5 mc crystal, and accessories and instruction book, first \$100. Julio Bellber, 503 W. 174th St., New York 33, N. Y.

FOR SALE — Harvey-Wells TBS-50 for use with xtal or carbon mike, \$50, with homemade pwr supply and coax. relay, \$65. Robt. Schumacker, 100-06 75 Ave., Forest Hills, N. Y.

SWAP OR SELL — War surplus xmtr-rcvr No. 19 Mk. II, 2-8 kc, instructions, cables, junction box, 3 mike headfone sets, ant. coil, key, control unit, spare tubes, parts, 12 v. power supply. Dick Overholt, 130 16th Ave., San Francisco 18, Calif.

SELL OR TRADE — Projection tube optical assembly and housing with 4 mirrors, less 5TP4 pic. tube, from GE model 901 TV. Make offer, or trade for Riders manuals above 11. Dousman Electric, Dousman, Wis.

FOR SALE — 20 RCA coin-operated radios with matching tables. No reasonable offer refused. M. E. Stebbins, 845 Engard Ave., Delair, N. J.

WANTED — Precision 858 meter VOMA with push-buttons. Phil Woodbury, 1103 Commercial St., Emporia, Kan.

FOR SALE — HQ129-X with spkr and 100 kc crystal calibrator, Viking Ranger with key and mike, both A-1 cond., \$350; Triband, \$18; 40M ARC5, \$15; Instructograph with phones, key, 10 tapes, osc., \$22. All FOB. P. R. Melcher, 2424 Washington Court, Fort Wayne, Ind.

FOR SALE — Ideal receiver for novice, SX24 in clean cond., RF stage, 2 IF's xtal filter variable selectivity, \$60. Morris M. Goodman, 2621 Burns Pl., Union, N. J.

FOR SALE — RCA TV sweep gen., WR-59A with manual and all test leads, good condition. Make offer. Roy Singer, 4 Atwood Rd., Plainview, L. I., N. Y.

SELL OR TRADE — Several 630-type TV sets. Eddie Howell, 245 Rural Station, Dillon, S. C.

SELL — Perfect Hi-Fi 1956 tape recorder, model VM-700, \$125; Eico 425 oscilloscope with probe set, satin aluminum panel, only \$60. Dennis O. Marote, 159 Bonney St., New Bedford, Mass.

FOR SALE — Knight capacitor checker, no need to rewire capacitors, \$11; tubes in original cartons; "Automatic Record Changers & Recorders" by Rider, \$2.50. Robert W. Gorseline, 9406 Seminole St., Silver Spring, Md.

FOR SALE — Almost new Lettine 240 transmitter with extra coils, \$50 or make offer; 12" extended range speaker in cabinet, \$12. William Bennett, 126 17th St., Wilmette, Ill.

WANTED — Surplus ART-13 xmitter for cash or 1/2 hp motor as part payment. C. B. Kelley, 7204 Cloverbrook Ave., Cincinnati 31, Ohio.

FOR SALE — RCA 78 rpm changer, less mtg. springs, \$10; Garrard 78 rpm changer, less crystal, phono lead and mtg. hardware, \$5. Willard L. Henry, 499 "I" St. SW., Washington, D. C.

FOR SALE — RCA TV chassis model TC-166 KCS40A, complete, less tubes, \$15 COD. Need welding torch, gas or elec. J. Kozma, 12450 NW 5th Ave., Miami 50, Fla.

WANTED — Heavy-duty 60-foot crank-up tower; rotator; 10-15-20 meter tri-band beam; 75A4, wide angle and telescopic lens for Argus C3. State cond. and price. K. Miller, 12612 Indianapolis, Los Angeles 23, Calif.

FOR SALE — Riders TV-15 manual, like new, in orig. carton. Best offer. Leon Straub, Marathon, Wis.

FOR SALE — Gonset deluxe tri-band converter, can be used for 6 or 12 v. cars, \$30; also 1. n. UHF converter, make offer. R. J. Drucker, 779 Bryant Ave., Winnetka, Ill.

SWAP OR SELL — Have metal locators, model airplane motors, sign painter's letter patterns. Want transistors, midjet parts for same. John Haynes, Doe Run, Mo.

FOR SALE — Riders 6-14; Sams 1-126; Vol. 1 NRI, others; Heath 6 v. batt. eliminator; signal tracer; Instrograph code machine, oscillator, 6 tapes. All A-1 shape. Trade for A-1 portable typewriter, HQ-140, 129X, DX-35, or S38C and D. Don Jensen, 3529 Dunn Ave., Cheyenne, Wyo.

WANT — Operating instructions and circuit diagrams for model 1175A professional all-wave, all-purpose tester, mtg. by Triplett for NRI. Will pay cash. John Lellelid, Box 16, Colman, S. D.

FOR SALE — Heathkit AV-1, modified with balancing resistors and extra diodes; AC VTVM, wired by professional sound man, excellent condition, \$16 FOB. Hal Magargle, 38 Bluebird Dr., Syosset, N. Y.

FOR SALE — Unused magnetic recording tape, prepaid: 6-1200' rolls plastic tape, \$11; 2400' Mylar on 7" reel, \$6.75; 1800' plastic, \$2.65. Guaranteed. W. N. Scott, Box 1153, Columbus, Ga.

WANTED — Small pole pig; 0-500 ma and 0-15 v. AC 3" rd. meters; 0-5 RF 3" meter; 500 w. RCA mod. trans. Sell two BC-625 transmitters. Mrs. E. L. Felder, Tylertown, Miss.

SELL OR SWAP — 10" Philco sets or chassis, others \$5 each or swap for typewriter, guitar or tape recorder. T. Wasek, Box 295, Rutherford, N. J.

WANTED — Operating and maintenance manual or other information pertaining to Collins KW-1 for students in electrical engineering. John Orr, 609 West Ash St., Piqua, Ohio.

WANTED — McMurdo-Silver 701 xmitter with 6 meter coils; McMurdo-Silver rcvr to tune 6M band. Send full information and lowest cash price. M. J. Thornhill, R. 2, Hoschton, Ga.

FOR SALE — Complete Sprayberry radio and TV course, less kits, \$26. Joseph Lacinak, 1579 Wellington Ave., Youngstown 9, Ohio.

WANTED — Riders troubleshooters manuals, radio and TV Vols. 1 to date; also Precision tube tester. State condition and prices. G. C. Barkoukis, 2196 Good-year Blvd., Akron 5, Ohio.

FOR SALE — Knight volttohmmeter test instrument, good condition, \$35. John Luciano, 90 Columbia Ave., Newark 6, N. J.

FOR SALE — Radion model 5000 UHF-VHF field strength meter, 75 UHF single channel converter, \$4.50; Meck T-60, all coils, 75 w. PA, no speakers; Regency DB-410 VHF booster; National TUB-1 booster; VX-101-JR VFO. R. T. Whitaker, Bishop, Tex.

FOR SALE — Used 4 hours Gonset communicator 6 meters, \$180, or receiver of like value. C. Fernandez, 81 Warren St., Roxbury 19, Mass.

SELL OR TRADE — Wireless No. 19 Mark III, with diagrams and schematics, power supply, ant. tuner, mike and headset, like new, not modified. Want photo equip., prefer 16 mm. Paul Kochenash, 1794 Newport Ave., Northampton, Pa.

WANTED — Instruction manual, schematic, align. procedure, etc., for HRG-Jr. Donald R. Martin, 104 Grosvenor Rd., Kenmore 23, N. Y.

FOR SALE — Heath 0-9 scope \$55, and TS3 sweep gen., \$40; Jackson 645 VTVM, \$35, all perfectly calibrated, complete with leads and op. manuals. S. L. Samoles, 617 E. Market St., Scranton 9, Pa.

WANTED — FM 40 to 50 mc, base station receiver, working or repairable. James E. Anner, Box 34, Hurley, N. Y.

SWAP — TV Teletone needs slight repair; Pre-selector; old Triplett tube tester; Meissner sig. shifter EX; several TV picture tubes. Ace Electric Co., 130 W. Pike St., Clarksburg, W. Va.

FOR SALE — BC-221 with power supply, \$60; Stancor 69 xmtr self-contained power supply, fone/CW 60 w., \$75; PE-103, \$25; S-20R, \$45; Scott-Marine rcvr, \$85. H. Kaplan, LaGrange, Ga.

SWAP — Coronet 3-D camera, flash and viewer, for 250 1/2 w. like new resistors, used intercom, or 1950 Chev. radio. Shannon Sellers, 1815 Pike Rd., Ensley, Ala.

SELL OR SWAP — Hi-voltage pwr. supply 1000 or 2000 volts at 250 ma. Make offer. Mike Yacenic, 105 Elm Dr., Trafford, Pa.

TRADE — Triplett VOM model 666HH, for Geiger counter or tube checker. James E. Beane, 351 5th St., St. Albans, W. Va.

FOR SALE — Masco MA-25PN amplifier, like new, 6 v. DC, 110 v. AC with built-in turntable, 78 rpm single speed motor, drivers, trumpets, kit matched plugs, breast mike and mount for automobile, plus all hookup cables, \$125. Barnett's, Inc., 314 Union St., Jonesboro, Ark.

WANTED — Used Sams TV schematics folders, assorted, cheap; Sprague Tel-O-Mike capacitor checker, sweep gen. Jack Moser, R-1, Lewisburg, Pa.

WANTED — Used Brute Force AC 110 v. line filter for 300 w. or less. Cash or what have you? Lee Singleterry, 1914 Ballinger Rd., Seattle, Wash.

FOR SALE — DB-20, like new, \$35 FOB. H. W. Lingenfelter, 21352 Kenwood Ave., Rocky River 16, Ohio.

FOR SALE — Riders TV Vols. 2 to 8, \$10 each, and TV 1 and radio 15, \$8 each. Isadore Cohen, 1511 Boston Rd., Bronx 60, N. Y.

WANTED — Audio generator and antique radio books. Can trade nursery stock or allied lines and radio magazines. Bob Farmer, Farmer Nursery, Plainview, Tex.

FOR SALE — GE portable model 160, rechargeable, good cond., but needs 2 v. battery, \$15; Gonset tri-band converter with master mobile 20 mtr. whip and mount, 1. n., \$30. James Hurst, 22 June St., Fall River, Mass.

FOR SALE — RCA WV-97A Senior Volt-ohmmyst, perfect, \$55 postpaid. R. B. Nelson, 419 Oak St., Mt. Morris, Mich.

FOR SALE — 2 meter FM Motorola xmtr, \$35; Select-O-Ject, \$10; perfect Stancor 203A xmtr, \$32. J. L. Miller, 118 Southland, South Bend 14, Ind.

FOR SALE — Philco 10" TV, model 1001, good working cond., \$22.50; Eico 232 VTVM, \$30; misc. Sams and Riders. H. Bell, 3917 Ely Ave., Bronx 66, N. Y.

WANTED — 12" or 15" Karlson enclosure or kit. State cond. and price. J. I. Smith, 456 Main St., Reynoldsville, Pa.

FOR SALE — 15 Tela-matic quarter control meters, 1/2 hr. operating time, good cond., \$5 each. Low's Radio and TV, 535 Chapala St., Santa Barbara, Calif.

FOR SALE — Heath A-7C 6 w. amplifier, built-in preamp, fine for PA or economy Hi-Fi, \$12; Webcor 80 wire recorder, \$35. Both good cond., shipping prepaid. J. Dykehouse, 1024 Woodward Avenue, Kalamazoo 54, Mich.

WANTED — Instruction book, schematic, BC-610E. State price. Irving Brager, 1770 Hillside Rd., Southampton, Pa.

FOR SALE — NRI course in Electric Appliance Training (32 lessons), good as new, \$12.50. 1 pay postage. Ewell Churchill, Cord, Ark.

WANTED — For cash, used 7JP4 pix tube in good cond; 6-12SN7, one 6C4. State cond. and price. E. A. Sawyer, Box 346, Marshall, N. C.

FOR SALE — Chicago Nuclear Geiger counter, 1. n., complete with earphones and red flasher, reasonable; "Privat-ear" pocket radio, make offer. Edwin C. Horacek, Rt. 2, Box 117, Yankton, S. D.

POSITION DESIRED — Exp. 1st phone man wishes employment as xmtr man or straight engineer, no announcing or DJ work. Gene Mick, 2317 Stanwood, Philadelphia 15, Pa.

FOR SALE — Transformerless type amplifier, Precision EV-20 VTVM, A-1 shape; Fairchild Hand grinder tool, never used. Kenneth E. Gould, 509 Vine St., Liverpool, N. Y.

WANTED — B & W coil 160-TL. Will trade or sell V-70-D, CK-707-B. Wood, 15 Church St., Fair Haven, N. J.

FOR SALE — TV sets, 10" and 12", needing repair, all picture tubes good, \$10 and \$15 each, pick up or pay freight. Hal Blackman, 8333 So. Drexel Ave., Chicago, Ill.

SELL OR TRADE — Kodak IV Velox rapid printer, prints 127, 116, 120, 616, 620 films jumbo, in A-1 cond., uses mechanical timer, \$450, or will trade for high grade communication rcvr of equal value. Al Werman, 103 Wesley St., Manlius, N. Y.

WANTED — Plastic cabinet for 40-41 Motorola table radio with 4 top push-buttons, any color. State cond. Models 56XAI or 56VAW wood cabinet. Albert Reeves, 623 Chestnut Ave., Niagara Falls, N. Y.

WANTED — Low power 2-meter rig, suitable for novice, must be reasonable. Charles Daringer, 401 7th Ave. SW, Oelwein, Iowa.

FOR SALE — Little used RCA WR-39C tel. calibrator; WR-59B tel. sweep gen.; WO-56A 7" oscilloscope; NRI signal tracer. Best offer. John Sevcik, 517 Fulton St., Wheeling, W. Va.

FOR SALE — Granco UHF converter, model LCU, like new, with UHF-VHF antenna connector, used slightly. Best offer. Luther V. Strader, 1217 Myrtle Ave., Danville, Va.

WANTED — Revere T-700 or TR-800 tape recorder. Eugene Kon, 1516 Broadway, Buffalo 12, N. Y.

SWAP — Over 200 mags, Popular Science, Popular Mechanics, Mechanix Illustrated, Popular Photography, 1942-1955. Want schematic diagrams, radio-TV magazines or anything for radio-TV servicing. John T. Wisniewski, 15801 Loomis Avenue, Harvey, Ill.

SELL OR TRADE — Supreme 589A tube tester; signal generator 576; Feiler Electronic stethoscope, model TS-3 signal tracer; Electronic Measurement multi-meter model 101A. Instructions with all. John Beechan, Box 97, Cairnbrook, Pa.

FOR SALE — 1949 Olds auto radio, audio sig. generator, FM converter 88-108 mc. Want FM rcvr for 150-173 mc or 30-50 mc. W. E. Fuller, 3137 West Michigan Rd., R. 1, Dimondale, Mich.

FOR SALE — RCA amplifier 25 w., \$15; I-Magnecorder PT6-J PT6-AH perf. cond., \$400. Audio Recording Service, 1900 University Ave., Madison 5, Wis.

FOR SALE — Precision E-200-C signal marking generator, very little used, \$40. L. Matushefske, 2 Elmont Rd., Elmont, L. I., N. Y.

WANTED — Used I.C.S. courses or misc. I.C.S. lesson texts, any subject. State copyright date, subject, and number of lessons. G. Crapsi, 251 N. Ellicott St., Williamsville 21, N. Y.

SELL OR SWAP — Webster-Chicago 78 wire recorder, \$25; Brush soundmirror BK411 with custom carrying case, \$95; Radio Craftsmen RC10 amp., \$25. Walter Landau, 40 E. 17th St., Brooklyn 26, N. Y.

SWAP — 10" table model Teletone TV set in working condition, for Geiger counter or modern tube tester. Martin Feldman, 265 Cabrini Blvd., New York 40, N. Y.

WANT — Good amateur receiver. Will trade S-38; Eico 5" scope; E-V push-to-talk carbon mike; Zenith AM-FM console; 815s. B. Keltner, 2619 Beryl Avenue, Baltimore 5, Md.

TRADE — Bradshaw sig. gen., 4 fixed freqs., and socket for crystals. Want reliable watch repair course, or books. John C. Mohlin, Route 1, Salisbury, Md.

FOR SALE — Zenith battery radio, model 4K600, not working, \$4; Motorola 3-way portable, \$6; Texal adj. nozzle spray gun, \$5; and old radio repair books. M. Kantonowitz, 544 Claremont Park, Bronx 57, N. Y.

FOR SALE — Cortley projection TV, up to 6' x 8' screen, RCA 630 chassis, metal cabinet with large rubber casters, 5" f1.9 lens, good cond., \$150; Riders 5 thru 15, \$75 FOB. R. H. Hall, 604 Tarento Dr., San Diego 6, Calif.

FOR SALE — Records by Cook: Marimba 1042, \$5.95 organ demonstration record, band 5007, Caribean 5003, steel bands all like new, all for \$10.50 postpaid. Want Hi-Fi basic tape recorder. Harry Boyer, 4909 Buford, Millington, Tenn.

WANTED — 12" or 14" TV in good cond., reasonable; also want tape recorder. Canadian only. Duane Loewen, 7A Heins Ave., Kitchener, Ontario, Can.

WANTED — QST, May, 1916; also C-D Capacitor for Apr., May, June, 1937, vol. 1 #2; Oct., Nov., Dec., 1937, vol. 1 #4; June to Dec., 1939, vol. 3 #2. J. J. Simpson, 85-39 152nd St., Jamaica 32, N. Y.

SELLING OUT — TV repair business — tubes, scope, signal generator, service manuals, Photofacts. Local only. Fred Levitt, 224-15 135th Ave., Laurelton 13, N. Y.

FOR SALE — Riders vols. 6 to 12 inclusive with index; Webber model 20 signal generator, 7 bands 90 kc to 60 mc, portable, re-calibrated; Triplett tube tester, model 1213. Best offer. A. G. Johnson, Route 1, Box 203, Spencer, Ind.

FOR SALE — Johnson Viking 2, VFO, like new, matchbox brand, \$275 FOB; Knight capacity checker kit, assembled and wired, \$15; Astatic AT-1 TV booster, \$10. All find cond. J. Farrier, 223 Bird Ave., Sidney, N. Y.

FOR SALE — Zenith transoceanic portable, chassis 5H40, 110-220 v AC-DC, good set of batteries, 7 band broadcast to 31 mc, A-1 condition, \$45. Eugene Adams, 755 Delfield Ave., Staten Island, N. Y.

SELL OR TRADE — 4" PM speakers, filament transformers, crystal mike, 300 radio tubes, misc. TV parts. James Fred, Box 54, Russiaville, Ind.

FOR SALE — Gonset model 3058 6-meter communicator, 12 v., 110, with Western Elec. telephone headset. Make reasonable offer. Martin Weinberg, c-o Edmar Corp., 719-25 North 24th St., Philadelphia 30, Pa.

FOR SALE — RTTA Radio-TV correspondence course (less kits), 118 lessons, \$40. P. S. Coppola, 609 Lincoln Way East, South Bend, Ind.

FOR SALE — SX28A with speaker; E-400 sweep gen.; complete 2-meter mobile; Sonar MR3 mobile rcvr; 522 xmitters for 2-6-10 meters, Gothard SP-17 generator; 12GP7 CRT. A. Turturro, 146-26 North Hempstead Tpke., Flushing 55, N. Y.

WANTED (for Boy Scout group) — Binoculars, late, coated lens, Zeiss or Bosch & Lomb, 7 x 50 and 15 x 20 or 20 x 50; AC generator; disc recorder for cash. S. Krzak, 65 Main St., Pawtucket, R. I.

FOR SALE — Unused 15GP22 color CRT, \$50; used "working" 40-tube color TV chassis with good 15" CRT, locally \$100. R. & M. Television, 284 Morris Ave., Elizabeth 3, N. J.

WANTED — Sams Photofacts, good cond., all numbers. Dick Yeager, 812 Larkfield Rd., East Northport, L. I., N. Y.

FOR SALE — Revere T-100 tape recorder, \$50 FOB. George H. Jaspret, 35 Alden Rd., Andover, Mass.

SELL — Complete mobile rig, \$75; 6 v. - 420 v. dynamotor, \$10; 1000 v. generator, \$10; 3000 w. AC plant, \$175; 2500 w. plant, \$150; 10" metal lathe. Need modern tube tester. E. E. Hampshire, Seymour, Mo.

FOR SALE — Amateur station, complete: Viking II and VFO, Matchbox, SX-71, R42 Bass Reflex speaker, Hy-lite 3E10F beam, Alliance Tenna-Rotor and thrust bearing, 5-section 35' mast, Shure 704 mike, earphones, and key, \$495 FOB. Wayne P. Keyes, 7306 Ellis Ave. SE, Albuquerque, N. M.

WANTED — By young boy, a cheap 3" or 5' scope for experimenting and learning about electronics. James V. Motsinger, C.C. #6, Aberdeen, Md.

FOR SALE — Hallicrafter SX42 receiver, \$175; Triplett 666R VOM, \$18; Bogen R660 FM-AM Hi-Fi tuner, \$90; Pilot 3" TV in good working cond., \$40. Al Dayes, 29 Charles St., Merrick, L. I., N. Y.

BARGAIN — Heathkit 0-8 scope, \$30; KW power supply components, \$60; 500 v. 500 ma supply components, \$25; 800 v. 200 ma and 275 v. 150 ma wired, \$17.50. Marc Molyneux, Jr., 214 E. 19th St., Anniston, Ala.

SWAP — Hallicrafters S-76, like new, for Keystone 8 mm movie projector model K-109 or equivalent. Andrew Lontka, 130 Beech St., Kearny, N. J.

WANTED — 25 kw. gas or diesel generator, output 230 v. AC, 60 cy., 3 phase; also used 12" overhead cutter. Thomas Manning, WHIL, 99 Revere Beach Pkwy., Medford 55, Mass.

FOR SALE — Heath FM-2 tuner, \$10; Transvision CRT tester and reactivator, \$10, plus postage. J. R. Flaherty, 140-27 172nd St., Jamaica 34, N. Y.

SWAP — Auto Graflex camera, 3 x 5, Folmer & Schwing, 3.5 B&L Zeiss Tessar lens, focal plane shutter, tripod, studio lites, encyclopedia, darkroom equipment. Want scope, generators, Hi-Fi equip. Wm. W. Moore, 2000 So. Grant St., Arlington 2, Va.

SELL — Presto Rec-O-Kut model 8-K professional record cutter with playback and PA system, \$175; also good used intercom systems, reasonable. John C. Orlow, 1049 N. 70th St., Milwaukee 13, Wis.

FOR SALE — Riders 1 thru 16; test equip.; tubes, controls, switches, xformers, audio and power spkrs, condensers, resistors, general service material. Not sold separately. Herman McMasters, 1800 So. 26th St., Terre Haute, Ind.

FOR SALE — Heath condenser and res. bridge; signal tracer; sig. gen., like new, \$18 each, plus postage. Also old-type radio tubes, 25 cents each, send for list. W. F. Onder, Rt. 2, Box 193, Arnold, Mo.

FOR SALE — High quality radio electronic test equip., exc. cond., such as scope, VTVM, audio osc., sq. wave gen., etc. T. Tomey, 6013 Alta Ave., Baltimore 6, Md.

FOR SALE — Dumont scopes, nearly new with instruction manuals: model 208B, 5", \$160; 164E, 3", \$37.50, or \$175 for both; Collins 310B exciter with 70E-8 oscillator, instructions, \$175. Lester Harlow, 5901 Paul St., Alexandria, Va.

FOR SALE — Riders manuals 1 thru 20, except Vol. 15, to be sold at \$3 per volume, or \$57 for the set. Edwin A. Gruneich, Hunter TV-Radio Lab, Hunter, N. D.

SELL OR TRADE — Good low freq. mobile equip. Have 8 mm Bolex movie camera, with all lenses, filters, case, etc., value \$600; also Tecraft 2-meter xmitter, converter, power supply and Hallicrafters SX99 rcvr. Best offer. Marty Feins, 196 Lyons Ave., Newark, N. J.

WANTED — Good used communications receiver and novice xmitter with novice band crystals. Give complete details in first reply. H. A. Loring, PO Box 6080, Charlotte 7, N. C.

WANTED — Tubes: transmitting, receiving, TV, special purpose, diodes, transistors, klystrons, magnetrons, ignitrons, ruggedized, G-M counter tubes, multipliers, subminiatures. Cash or swap for tubes or equip. needs. C. D. Gensler, 56 Crosby St., New York 12, N. Y.

WANTED — Dumont model 208-B scope. Swap other test equip., Philco UHF converter, Meissner analyzers, and 7" and 17" TV. Cash if cheap. Bernard Franklin, 1117 McKennie Ave., Nashville, Tenn.

WANT — Lampkin test gear, any condition; Linguaphone Institute courses, any language. E. Howell, 2607 Main St., Rt. 2, Mt. Vernon, Ill.

WANTED — "Electronics," April and May, 1956 only. State price and condition. F. E. Miller, 3122 SE 73 Ave., Portland 6, Ore.

SELL OR TRADE — Multitesters, meters, hand tools, tubes. Want scope, FM and SW receiver, 5-prong plug-in Hammarlund coils. Roby, 2422 No. Halsted St., Chicago 14, Ill.

SELL — Testrite enlarger, \$25; Hallicrafters S-20R receiver, \$40; Heathkit 09 scope, \$55, all like new; 10" Motorola TV console, needs minor repairs, \$20; 6 v. vibrator supply, filtered, \$10. R. Mills, 150 Prospect Park W., Brooklyn 15, N. Y.

FOR SALE — Unused Eico signal gen. kit model 322K, ideal for AM, FM and TV marker, unassembled. Best offer takes it. J. G. Prezioso, 432 5th St., Niles, Ohio.

FOR SALE — Used Motorola, RCA, Kaar, and GE 2-way communications equip.; 25-50 mc and 152-174 mc; xmitters and receivers complete with accessories, \$60 to \$125 as is. S. E. Tima, 6029 North 12th Ave., Phoenix, Ariz.

FOR SALE — Ampex 403 console broadcast quality tape recorder, 1. n., full track, 7 1/2 & 15 ips, slight use, \$750; Ampex 400 single case portable, dual track, 7 1/2 & 15 ips, exc., \$575. Bob Meifford, Box 178, Burlington, Iowa.

FOR SALE — CRT adaptor for NRI model 70 tube tester, like new, \$3. Drosch Radio-TV Service, Box 147, Burkettsville, Ohio.

Cornell-Dubilier

DECADE RESISTORS



MODELS RDA - RDB - RDC

1 OHM TO 1,111,110 OHMS
IN STEPS OF 1 OHM

C-D Decade Resistors provide a reliable source of resistance for substitution purposes in a wide variety of electronic and electrical applications within the current and resistance rating of each unit. Units of resistance are selected from the direct reading panel switch scale.

Each instrument permits a possible selection of 110 resistance values.

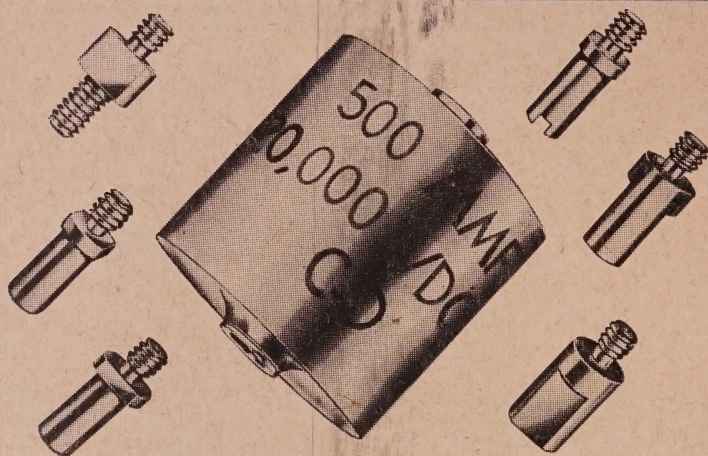
RDA \$12.15

RDB \$12.50

RDC \$12.50

USER'S NET PRICES

One body with 6 interchangeable
terminals for the widest mounting combinations.



C-D's NEW

**Mity
Mike[®]**

(type MMU)

CERAMIC CAPACITORS

- Interchangeable terminals take less room in your parts kit — let you do the job right
- Just attach the needed terminals to fit the job . . .
- Always the right ceramic unit handy — and without tying up money in a big stock
- With the improved construction and processing at point where corona-effects attack
- Rugged — stable — durable
- Use it at *Full Rated Voltage*
- Precision manufactured with extra-large safety margin — greater dependability
- Now at your C-D Jobber. For his name and address see your Classified Telephone Directory. Catalog on request, Dept. CAP, Cornell-Dubilier Electric Corp., South Plainfield, N. J.



CONSISTENTLY DEPENDABLE
CORNELL-DUBILIER

There are more C-D capacitors in use today than any other make.

Plants in South Plainfield, N. J.; New Bedford, Worcester and Cambridge, Mass.; Providence and Hope Valley, R. I.; Indianapolis, Ind.; Sanford, Fuquay Springs and Varina, N. C.; Venice, Calif.; and subsidiary, The Radiant Corporation, Cleveland, Ohio.